Corbett maths

Simultaneous Equations
Video 295 on www.corbettmaths.com

Examples

Workout

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Question 1: Solve the following simultaneous equations by using elimination.

(a) $6x + y = 18$, $4x + y = 14$

(b) $4x + 2y = 10$, $x + 2y = 7$

(c) $9x - 4y = 19$, $4x + 4y = 20$

(d) $2x + y = 36$, $x - y = 9$

(e) $6x - 3y = 12$, $4x - 3y = 2$

(f) $3x - 6y = 6$, $2x - 6y = 3$

(g) $8x + 7y = 39$, $8x + 2y = 34$

(h) $x + 3y = 38$, $x + 6y = 53$

(i) $6x + 3y = 48$, $6x + y = 26$

(j) $2x - 4y = 10$, $2x + 3y = 24$

(k) $5x - 2y = 120$, $5x + y = 165$

(l) $x - 2y = 8$, $x - 3y = 3$

(m) $3x + 2y = 54$, $2x - 2y = 16$

(n) $7x - 4y = 80$, $3x - 4y = -80$

(o) $5x - 2y = -23$, $5x - 6y = -39$

(p) $6x + 2y = -26$, $2x + 2y = -10$

(q) $x - 5y = 65$, $2x - 5y = 85$

(r) $10x - 10y = -40$, $10x + 4y = 16$

Question 2: Solve the following simultaneous equations by using elimination.

(a) $3x + 2y = 23$, $2x - y = 6$

(b) $3x - 3y = 9$, $2x + y = 12$

(c) $4x + 2y = 34$, $3x + y = 21$

(d) $9x - 4y = 59$, $2x - y = 12$

(e) $2x + 8y = 43$, $x + 3y = 18$

(f) $6x + 3y = 45$, $2x - 2y = 12$

(g) $5x + 4y = 130$, $x + 6y = 130$

(h) $10x - 15y = 25$, $x - 2y = 1$

(i) $3x + 8y = 97$, $2x + 4y = 58$

(j) $3x - y = 4$, $5x + 4y = 52$

(k) $4x + 9y = 10$, $2x + 3y = 2$

(l) $5x - 3y = 33$, $3x - 9y = 63$

(m) $2x + 4y = -2$, $4x + 2y = -10$

(n) $8x + 4y = -28$, $3x - 12y = 30$

(o) $15x - 4y = 82$, $5x - 9y = 12$

(p) $12x + 3y = 9$, $2x + 11y = -9$

(q) $9x - 7y = 111$, $x - 2y = 16$

(r) $8x - y = 4$, $3x + 8y = -166$

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Question 3: Solve the following simultaneous equations by using elimination.

(a) $2x + 2y = 14$
$5x - 3y = 19$

(b) $2x + 3y = 1$
$7x + 2y = -22$

(c) $5x + 3y = 22$
$2x + 4y = 20$

(d) $5x - 6y = 28$
$4x - 4y = 24$

(e) $3x + 2y = 7$
$2x + 9y = 43$

(f) $3x + 3y = -6$
$4x - 4y = -24$

(g) $3x + 8y = 31$
$5x + 3y = 31$

(h) $7x - 15y = 2.5$
$3x - 2y = 5.5$

(i) $3x + 2y = 53$
$2x + 5y = 72$

(j) $5x - 3y = 18$
$2x + 4y = 54$

(k) $2x + 9y = 11$
$9x + 3y = -63$

(l) $2x - 4y = 4$
$5x - 3y = 24$

(m) $3x + 3y = 42$
$2x + 4y = 38$

(n) $6x + 2y = -2$
$4x - 3y = 29$

(o) $4x - 4y = 8$
$5x - 3y = 18$

(p) $4x + 3y = 9$
$5x + 2y = 13$

(q) $4x - 2y = 18$
$2x - 3y = 15$

(r) $5x + 2y = 38$
$2x - 3y = 19$

Question 4: Solve the following simultaneous equations by rearranging and then using elimination.

(a) $x = 10 - y$
$2x + y = 17$

(b) $x - 4 = y$
$x + 3y = 12$

(c) $2x + 6y = 4$
$x = 12 + 2y$

(d) $3x = 10 + 5y$
$3y = 52 - 4x$

(e) $2x + y - 18 = 0$
$3y = 7x + 80$

(f) $6x + 2y + 6 = 0$
$7x - 5y - 93 = 10$

Apply

Question 1: The cost of buying a coffee and a tea in a cafe is £4.
The cost of buying a coffee and three teas in a cafe is £7.
Work out the cost of buying a coffee and the cost of buying a tea.

Question 2: The sum of Rosemary's age and Hannah's age is 102 years.
The difference between Rosemary's age and Hannah's age is 52 years.
Rosemary is older than Hannah.
Find the age of each woman by using simultaneous equations.

Question 3: Five adult tickets and three child tickets for a movie cost £58.
Two adult tickets and eight child tickets for a movie cost £47.
Find the cost of each type of ticket.

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Question 4: Four chairs and two tables cost £218.
Six chairs and seven tables cost £587.
Find the total cost of buying twenty chairs and five tables.

Question 5: A plumber charges a price for each hour, £h, and a fixed charge, £c.
A 5 hour job costs £155 in total.
A 8 hour job costs £230 in total.
How much would a job that lasts 2 hours cost?

Question 6: Barry buys 200 pieces of stationery for £76.
Of the 200 pieces of stationery, x of them are rulers that cost 50p each and y of them are pens that cost 20p each.
Find how many rulers Barry buys and how many pens he buys.

Question 7: In a greengrocers, 4kg of bananas and 3kg of apples costs £7.50
In the same greengrocers, 3kg of bananas and 5kg of apples costs £8.10
How much would 2kg of bananas and 2kg of apples cost?

Question 8: Can you spot any mistakes in the question below?

Solve the simultaneous equations

$3x + 5y = 1$ x2
$2x - 3y = 7$ x3

Do not use trial and improvement

$6x + 10y = 2$
$6x - 9y = 21$
$19y = 23$
$y = 1.21$

$3x + (5 \times 1.21) = 1$
$3x + 6.05 = 1$
$3x = -5.05$
$x = -1.68$

x = ... -1.68 .... y = ... 1.21 ....
(4)

Answers

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